

On the Taxonomy of the Genus Emys, C. Duméril.

By Dr. G. Baur, Clark University, Worcester, Mass.

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I have just read Prof. L. Vaillant's paper, "Sur la Signification taxinomique du Genre *Emys*, C. Duméril" ("Ann. Sc. Nat. Zool. et Pal.," vii^e série, Tome xii, No. 1, Paris, 1891, pp. 51-63). Prof. Vaillant attempts to show that the type of *Emys* is not *Emys orbicularis* L., as nearly generally admitted lately, but *Testudo picta* Schneider, now generally known under the name of *Chrysemys picta*, and I think he is correct in this. I am, however, unable to follow him in all his other conclusions. I should like to add first, that the name proposed by Brogniart in manuscript, before Duméril had used the French name, les Emydes, in 1804, had been "*Syrinx*." In Isidore Geoffroy-Saint-Hilaire's paper on Trionyx, published in 1809, in "Ann. du Mus. d'Hist. Nat., Paris," Vol. xiv, I find the following note on page 3: "On lisoit dans le manuscrit demeuré au secrétariat de l'Institut jusqu'à la publication du volume des Savans étrangers le nom de *syrinx* au lieu de celui d'émyde, mais M. Duméril ayant depuis proposé ce dernier nom, M. Brogniart l'adopta lors de l'impression de son Mémoire."

Besides, I should like to state that the original paper of Brogniart, "Essai d'une classification naturelle des Reptiles," appeared for the first time in 1799, in the "Magazin encyclopédique, ou Journal des Sciences, des Lettres et des Arts," rédigé par A. L. Millin, Vol. vi, pp. 184-201, An. viii, 1799, and was reprinted in the "Bulletin des Sciences, par la Société Philomatique," No. 35, pp. 81, 82, Paris, Pluviose, an 8 de la République, and No. 36, pp. 89-91, pl. vi, Ventose, an 8 de la République (1800).

It was Michael Opper* who, for the first time, used the fact already noticed by Schüpff, that in *Emys orbicularis* the front portion of the plastron is movable, to distinguish in the genus *Emys* three subdivisions.

"Subdivisiones secundum scriptores recentissimos.

"(a) Sterno antice mobili, e.g., *Emys lutaria*.

"(b) Sterno cruciformi, e.g., *E. serpentina*.

"(c) Collo longissimo, sub testam arcuate reflexa, non retractili, e.g., *E. longicollis*."

E. serpentina was placed in a new genus, *Chelydra*, by Schweigger, in 1812 ("Königsberger Archiv für Naturwissenschaft und Mathematic," Vol. i, pp. 280, 292, 293, Königsberg, 1812), † and *E. longicollis* in the new genus *Chelodina*, by Fitzinger, in 1826.‡

* Opper, Michael, "Die Ordnungen, Familien und Gattungen der Reptilien," München, 1811, p. 11.

† This is the original publication.

‡ Fitzinger, L. T., "Neue Classification der Reptilien," Wien, 1826, p. 6.

Brogniart, who proposed the Latin name "*Emydes*" in 1805 for Duméril's French name "*les Emydes*," had given the following species as belonging to it: *E. ferox*, *E. rostrata*, *E. matamata*, *E. lutaria*, *E. pennsylvanica*, *E. clausa*.

E. ferox and *E. rostrata* belong to *Trionyx* Geoffroy, 1809; *E. matamata* to *Chelus* Duméril, 1806; *Chelys* Oppel, 1811.

It was Merrem * who divided the remaining species of Emys into two groups.†

(a) *Emys*--

"Digiti distincti, unguibus acutis.
Rostrum corneum.
Sternum immobile."

* Merrem, Blasius, "Versuch eines Systems der Amphibien," Marburg, 1820, pp. 22, 27.

Merrem places the *Testudo lutaria*, with the following synonyms: *Testudo lutaria* L., *T. orbicularis* (?) L., *T. europæa* Schneid., *T. caspica* Gmel, among his *Emys*, not knowing that in this form the anterior part of the plastron is movable.

† I have to say, however, that Rafinesque had already, five years before, reached the same conclusion in a book which is very rare, but of which my friend, Mr. S. Garman, has a copy. I have to thank Mr. Garman for copying for me the part relating to the Testudinata. The title of the book is "Analyse de la Nature ou Tableau de l'Univers et des corps organisés," Palerme, 1815. On page 75 we find:

"*Cryptephia*. Les Cryptephiens.

"Carapace inférieure à 1 ou 2 valves mobiles; enfermant les membres comme dans une boîte.

"G. 3. *Cheliphus* R.; 4. *Uronyx* R.; 5. *Didicla* R.; 6. *Monoclista* R.

"*Emydania*. Les Emydiens.

"Carapace ni coriace, ni à valves mobiles, pieds à doigts libres ou palmés.

"G. 7. *Emyda* R., *Emys* Dum.; 8. *Chemelys* R.; 9. *Chelopus* R.; 10. *Chelydra* R., *Chelys* Dum.; 11. *Cheliurus* R."

Unfortunately Rafinesque did not give the names of any species with the new genera, nor did he give any characters. From a later paper, which was written in 1816, but not published before 1832, we receive some information by Rafinesque (Rafinesque, C. F., "Description of Two New Genera of Soft-shell Turtles of North America," *Atlantic Journal and Friend of Knowledge*, Vol. 1, No. 2, Philadelphia, summer of 1832, pp. 64, 65.

"*Cheliphus* Raf. Water turtles with valved shells, 5 claws and toes to all the feet.

"*Uronyx* Raf. An anterior valve to the shell, toes and claws 5 and 4, tail with a claw. *T. scorpioides*, etc.

"*Didicla* Raf. Bivalve lower shell, toes 5 and 4. Type *T. clausa*, *odorata*, etc.

"*Monoclista* Raf. Lower shell valvular anteriorly, toes 5 and 4. *T. retziana*, etc.

"*Chemelys* Raf. Warty scales, no valves, 4 toes to all the feet. *T. verrucosa*, etc.

"*Chelopus* Raf. No valve, toes not palmated 4 and 5. *T. punctata*, etc.

"*Cheliurus* Raf. No valves, feet palmated, a long scaly tail. *T. serpentina*, etc."

The group with movable valves, named *Cryptephia* by Rafinesque, contains, therefore, the genera *Sternotherus* = *Cheliphus*; *Cinosternum* = *Uronyx* = *Monoclista*; *Cistudo* = *Didicla*, part.

The group in which the valves are not movable, named *Emydania* by Rafinesque, contains the genera *Emys* = *Emyda*; *Clemmys* = *Chemelys* = *Chelopus*; *Chelydra* = *Cheliurus*.

(b) *Terrapene*—

“*Digiti distincti, unguibus acutis.*

Rostrum corneum.

Sterni lobo anteriore, aut utroque mobili.”

Two years later, in 1822, Fleming established the genus *Cistuda** for the tortoises, in which the entrance to the cavity is formed by a lid. *Cistuda* is simply a synonym of Merrem’s *Terrapene*, and has to be abandoned therefore.

In 1825, Gray† follows Merrem, adopting the genera *Emys* and *Terrapene* (written *Terraphene*) ; “*Cistuda* Say” is declared a synonym of *Terrapene*.

In the same year Bell‡ published an important paper not mentioned by Prof. Vaillant, in which he shows that *T. europæa* Schneid. (*orbicularis* L.) has to be included in “*Terrapene* Merrem, *Cistuda* Say.” He says of *T. orbicularis* L. : “On examining sometime since a shell of this species, the first I had seen, which had lost the sternum, I was struck with the appearance of the articular surface from which that part had been removed, and immediately concluded that it must belong to the present group, having a movable breastplate, notwithstanding Merrem, to whom belongs the credit of having separated the ‘Box Tortoises’ under his subgeneric division *Terrapene*, retains this species amongst his *Emydes*, the character of which, on contradistinction to *Terrapene*, is that the sternum is entire and fixed. On consulting Schöppf, I found that, with his usual accuracy, that author had mentioned the movable structure of the sternum, and subsequent observations have established my first conjecture that it belongs to this genus.”

Now this leaves no doubt whatever that from 1825 the name *Emys* could not be applied to *T. orbicularis* L., but that this species belonged to *Terrapene* ; and since *Terrapene* Merrem is the same as Oppel’s subdivision, with *Emys lutea* as type, this species, which is now known as *E. orbicularis* L., has to be considered the type of *Terrapene*.

Gray§ follows Bell in 1831, but uses now the name *Cistuda* of Fleming, which he calls *Cistuda* Gray, not *Cistudo* as remarked by Prof. Vaillant.

* It is difficult to say whether this name *Cistuda* is a misprint or not. It could either stand for *Cistula*, from *cista*, the diminutive of *cista*, which means a small box, or for *Cistudo*, formed in the same way as *Testudo* from *testa*. It seems that Dumeril and Bibron introduced the name *Cistudo* for the first time in 1835.

† Gray, John Edward, “A Synopsis of the Genera of Reptiles and Amphibia,” “Ann. of Philos.,” Vol. ix, pp. 210-212, London, 1825.

‡ Bell, Thomas, “A Monograph of the Tortoises, having a Movable Sternum, with Remarks on their Arrangement and Affinities,” *Zoölog. Journ.*, Vol. II, pp. 299-310, London, 1825.

§ Gray, J. E., “A Synopsis of the Species of the Class Reptilia,” p. 7 ; published as Appendix to Vol. ix of Cuvier’s “Animal Kingdom,” edited by Edward Griffith, London, 1831. In the same year appeared another separate edition, with additions : Gray, John Edward, “Synopsis Reptilium, or Short Descriptions of the Species of Reptiles,” London, 1831. The original paper was written October, 1830 ; the second edition of it in January, 1831.

In 1828, Ritgen* subdivided the genus *Emys*, in *Emys* and *Clemmys*, and retained *Terrapene* Merrem.

The following species are united with *Clemmys*: *E. punctata*, *planiceps*, *glutinata*, *centrata*, *subrufa*, *melanocephala*. Of these *E. punctata* Schöppf = *T. guttata* Schneider, has to be considered as type.

As correctly stated by Prof. Vaillant, *T. picta* Schn. has to be considered as type of *Emys*, and *Chrysemys* Gray, 1844, becomes therefore a synonym of *Emys*.

The first author who subdivided the *Terrapene* Merrem, as limited by Bell in 1825, was C. L. Bonaparte,† who separated the American box tortoises under Fleming's name *Cistuda* in 1830 and 1831, from *Emys*, with *T. orbicularis* as the type.

In 1836, Fitzinger proposed a new name, *Pyxidemys*, to contain the following species: *T. carolina* L. (*T. scheideri* Schweigg., *T. virgulata* Daud.), *Sternotherus trifasciatus* Bell, and *T. amboinensis* Daud. If there would be an objection to the name *Cistuda* in the sense of Bonaparte, Fitzinger's name *Pyxidemys* ought to be used with the *T. carolina* L. as type. But I think it will be the best to use the name *Cistuda* in the correct form of *Cistudo*.

As a result we have the following :

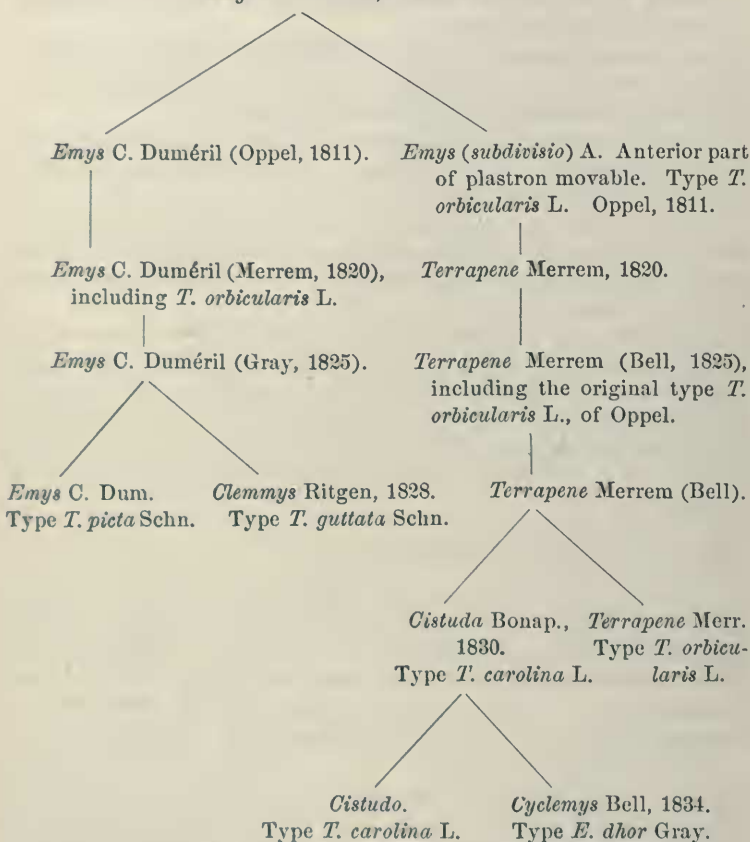
<i>Emys</i> C. Duméril, s. str.	=	<i>Chrysemys</i> (Gray), Type <i>T. picta</i> Schneider.
<i>Terrapene</i> Merrem	=	<i>Emys</i> (Boul.) “ <i>T. orbicularis</i> Lin.
<i>Cistudo</i> Bonap. non Flem.	=	<i>Cistudo</i> (Boul.) “ <i>T. carolina</i> Lin.
<i>Cyclemys</i> Bell	=	<i>Cyclemys</i> (Boul.) “ <i>E. Dhor</i> Gray.
<i>Clemmys</i> Ritgen	=	<i>Clemmys</i> part (Boul.) “ <i>T. guttata</i> Schn.

I have shown some time ago that in *Cistudo major* Agassiz, the zygomatic arch is complete (*Science*, April 3, 1891, p. 190), as in *T. amboinensis* Daud., notwithstanding I believe that the Asiatic and American forms are generically separate. I am unable to say whether *T. amboinensis* Daud. belongs to the genus *Cyclemys* Bell, with *E. Dhor* Gray as type, or not. Prof. Vaillant is inclined to place *T. amboinensis* in a genus distinct from *Cyclemys* Bell, for which he uses the name *Terrapene*. The correct name would be *Cuora* Gray, introduced in 1855.

The whole question relating to the taxonomy of *Emys* Duméril may be developed in the following table :

* “Ritgen, F. A., Versuch einer natürlichen Eintheilung der Amphibien,” “Nova Acta Nat. Cur.,” Vol. xiv, pp. 257-284, Bonn, 1828.

† Bonaparte, C. L., “Osservazioni sulla seconda edizione del Regno Animale del Barone Cuvier,” Bologna, 1830. And “Saggio di una distribuzione metodica degli Animalia Vertebrat Giornale Arcadico di Scienze,” etc., Roma, Vol. xlix, 1831.

Emys C. Duméril, 1806.

I place now the views of Boulenger, Vaillant and myself together :

Baur.	Vaillant.	Boulenger.
<i>Emys</i> C. Dum., s. str.	<i>Emys</i> C. Dum., s. str.	<i>Chrysemys</i> .
Type <i>T. picta</i> (Herrm. MSS.) Schn.	Type <i>Emys picta</i> Schöppf.	
<i>Clemmys</i> Ritgen.		<i>Clemmys</i> .
Type <i>T. guttata</i> Schn.		
<i>Terrapene</i> Merrem.	<i>Cistudo</i> Gray.	<i>Emys</i> .
Type <i>T. orbicularis</i> L.	Type <i>Cistudo orbicularis</i> L.	
<i>Cistudo</i> (<i>Cistuda</i> Flem.) Bonap.		<i>Cistudo</i> .
Type <i>T. carolina</i> L.		
<i>Cyclemys</i> Bell.	<i>Cyclemys</i> Bell.	<i>Cyclemys</i> , part.
Type <i>Emys dhor</i> Gray.	Type <i>Cyclemys dhor</i> Gray.	
<i>Cuora</i> Gray.	<i>Terrapene</i> Merrem.	<i>Cyclemys</i> , part.
Type <i>T. amboinensis</i> Daud.	Type <i>Terrapene amboinensis</i> Daud.	

The only modification in Boulenger's catalogue necessary is to change his *Chrysemys* in *Emys*, and his *Emys* in *Terrapene*.